

WHAT IS CLAIMED IS

1. A solid-water material for detoxifying chemical and biological agents, comprising:
a detoxifying reagent, and
a hydrophobic nanoparticle material encapsulating said detoxifying reagent.

2. The solid-water material of Claim 1, wherein said detoxifying reagent and said hydrophobic nanoparticles are in a weight ratio in the range of about 95:5 to about 80:20.

3. The solid-water material of Claim 1, wherein said hydrophobic nanoparticles comprises 3-7% of the solid-water material for detoxifying chemical and biological agents.

4. The solid-water material of Claim 1, wherein said detoxifying reagent is composed of an aqueous or mixed solvent solution containing at least one active reagent.

5. The solid-water material of Claim 1, wherein said detoxifying reagent is selected from the groups consisting of hydrogen peroxide, potassium permanganate, sodium hypochlorite, ammonium persulfate, and ammonium peroxydisulfate, and other liquid biocide or oxidizing agent.

6. The solid-water material of Claim 1, wherein said hydrophobic material is selected from the group of treated materials consisting of silica, alumina, clay, and other refractory oxides.

7. The solid-water material of Claim 1, wherein said detoxifying reagent is composed of 1N oxone solution, and wherein said hydrophobic material is composed of treated fumed silica.

8. The solid-water material of Claim 7, wherein said 1N oxone solution and said treated fumed silica comprises a solid powder having a 80:20 to 95:5 wt/wt ratio.

9. In a method for detoxifying chemical and biological agents involving directing a material containing a decontaminating agent onto the chemical or biological agent, the improvement comprising:

providing a solid-water detoxifying reagent, and depositing the solid-water detoxifying reagent directly on the chemical or biological agent.

10. The improvement of Claim 9, wherein said solid-water detoxifying reagent is formed as a powder.

11. The improvement of Claim 9, additionally including forming the solid-water detoxifying reagent by encapsulating an active detoxifying reagent with a hydrophobic nanoparticle.

12. The improvement of Claim 11, wherein encapsulating the active detoxifying reagent with a hydrophobic nanoparticle is carried out to form about a 95/5 weight ratio thereof.

14. The improvement of Claim 11, wherein the hydrophobic nanoparticle is formed by treating material selected from the group of fumed silica, alumina, clay and other refractory oxides with a hydrophobic chemical to alter surface characteristics thereof.

15. The improvement of Claim 11, wherein the active detoxifying reagent is selected from the group consisting of hydrogen peroxide, potassium permanganate, sodium hydrochlorite, ammonium persulfate, and ammonium peroxymonosulfate.

16. The improvement of Claim 11, wherein the active detoxifying reagent is composed of 1N oxone solution, wherein the hydrophobic nanoparticle is composed of hydrophobic fumed silica, and further encapsulating the solution in the fumed silica to produce a dry powder having/weight ratio of about 95:5 of solution to fumed silica.

17. The improvement of 11, wherein encapsulating the active detoxifying reagent with a hydrophobic nanoparticle is carried out by a technique selected from the group consisting of vigorous agitation, aerosolization, solution spraying with agitation, and solution dripping with agitation.

18. The improvement of Claim 9, additionally forming the solid-water detoxifying reagent by encapsulating an aqueous or mixed solvent solution of at least one detoxifying reagent with a 3-7% hydrophobic colloidal solid.

19. The improvement of Claim 18, additionally including forming the hydrophobic colloidal solid from a material selected from the group consisting of silica, alumina, and clays, and treating the material with a hydrophobic chemical to attack the surface characteristics thereof.